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PACKAGING WRAPPER

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

This patent application is a U.S. Nationalization of PCT application number PCT/EP99/07795 filed October 5, 1999 which is a PCT of EP application number 98203473.8 filed October 15, 1998.

FIELD OF THE INVENTION

The present invention relates to packaging for wrapping, appropriate for use with an article to be wrapped and consisting of a film that can be cut into separate sheets intended to be closed by folding around the article that is to be wrapped. Without being restricted thereto, the invention relates more specifically to the field of the wrapping of confectionery and chocolate products, or other consumables such as stock cubes, for example.

BACKGROUND OF THE INVENTION

In general, the articles are wrapped individually in a rectangular sheet of preprinted film of an appropriate size and shape, which individually-wrapped articles can in turn be packed in bulk in a wrapping bag of an appropriate size. The article to be wrapped, which for example is of parallelepipedal shape, is, according to a common method of wrapping, placed in the centre of the reverse side, that is to say the unprinted side of a rectangular sheet. The two longitudinal sides are then turned up (or down, depending on the orientation of the article and the type of wrapping machine) vertically against the longitudinal faces of the article. The lateral sides are then turned up vertically against the two transverse faces of the article and their upper edges are folded flat over the top face of the article, these last two operations necessarily taking place via successive and oblique folding operations with the longitudinal sides already turned up. Wrapping is completed by folding the top edges (which in the mean-time have become trapezium-shaped tabs) of the longitudinal sides, one over the other, over the top face of the article.

It should, however, be noted, that depending on the shape of the product that is to be wrapped and on the nature of the wrapping machine, other sequences for the folding of the wrapping sheet are possible, these folding sequences being performed in a well-determined

configuration of fold lines. This configuration of fold lines of the wrapping sheet always remains the same for the same article to be wrapped using the same wrapping method.

A significant problem which arises here is that of holding the folds at the end of the wrapping operation so that the wrapping remains closed. This securing can only be provided at the expense of a special choice of film used as substrate, which has to have appropriate mechanical properties such as pliability and, in particular, a pronounced tendency not to return to its initial position after the sheet has been folded during wrapping.

This problem presents itself, in particular, when wrapping articles of small size such as confectionery products like sweets, pralines, lollies, barley sugar, chocolate-covered bars, etc., or stock cubes.

One known solution is to select special substrates known for their high pliability, such as waxed paper, cellophane, aluminium laminates or alternatively synthetic films containing an appropriate amount of an additive that increases the pliability of this substrate.

This solution does, however, considerably restrict the possible choice of films used as substrates for wrapping or considerably increases its cost.

Sheets for wrapping certain articles, such as stock cubes, are also known, in which films the wrapper is closed by bonding. For this purpose, the sheets comprise, on their right side, that is to say the side on the outside of the article that is to be wrapped, a hot-sealing coating structure, the configuration of which is adapted to suit the configuration of the folds made during wrapping.

This wrapping process has the disadvantage that the wrapping machine has to be specially adapted to this process in so far that a source of heat is required. Furthermore, if this source of heat consists of heating plates, bonding can be achieved only on perfectly plane surfaces of the article that is to be wrapped and, in addition to the time needed to make the weld, requires relatively high pressure which a certain number of products are unable to withstand.

Another drawback is that this wrapping process is completely unsuitable for wrapping heat-sensitive articles, particularly chocolate products, and does not allow the selection of a wrapping substrate which has low temperature resistance.

Patent Application EP-0,870,695 proposes a wrapping sheet intended to be closed by folding around the article, the right side, that is to say the face which is going to be on the outside of the article, of which comprises a cold-sealing coating structure arranged in a

configuration such that the sealant-coated regions become superposed when the sheet is folded around the article. These sealant-coated regions therefore secure the folds when the material of the sheet has the particular property of not being good at holding folds. This sheet does, however, have a thermally bonding lacquer which keeps the sheet closed and has the abovementioned drawbacks. The sheet also has the drawback that the reverse side has to have non-stick strips in order that it be possible for the film to be paid out from a roll.

Document EP 0 225 987 describes a wrapping film which on its right side and on its reverse side has regions coated with cold-sealing coatings, particularly two longitudinal strips, one on the right side and one on the reverse side. In order to be able to store this film in the form of a roll, these various adhesive regions must be arranged in such a way that they do not superimpose upon winding because such superimposition would cause these various regions to stick together and prevent the film from being unwound from the roll. However, this constraint as far as the location of the adhesive regions is concerned entails corresponding constraints on the folding configuration and on the wrapping process.

In fact, the two aforementioned documents pursue the same objectives, namely those of providing adhesive regions on the film to hold the folds and arrangements for storing the film in the wound state on a roll. The problem is actually, as already described hereinbelow, that, if the film comprises self-adhesive regions on the reverse side and on the right side, then when the film is wound onto a roll, some of these adhesive regions of two adjacent turns carry the risk of becoming superposed on the reel and of sticking together, which would prevent the film from being paid out from its reel.

The two documents attempt to solve this problem using different means. Document EP-0 870 695 provides regions of cold-sealing coating only on the right side. There is therefore no risk of mutual superposition during reeling. By contrast, in order to be able to solve the problem of holding folds, that document envisages a hot-sticking lacquer on the reverse side, which leads to the drawbacks already mentioned.

Document EP-0 225 987, by contrast, chooses a special arrangement of the cold-sealing coatings on the reverse side with respect to those on the right side or vice versa so that during reeling, the coatings of two adjacent turns are arranged side by side and there is no superposition. This solution does however dictate constraints on the wrapping process in so far as the configuration for folding has to be designed according to the location of the adhesive regions, when what is desired is the reverse.

BRIEF SUMMARY OF THE INVENTION

The object of the present invention is therefore to provide a new wrapper which allows the choice of film used to be broadened considerably and which allows the film to be stored on a roll without any constraints as far as the method of wrapping is concerned.

To achieve this objective, the present invention provides a packaging for wrapping in accordance with Claim 1.

The applicant company has surprisingly discovered that the at least partial prior coating of the film used as packaging for wrapping with a clearly defined cold-sealing coating makes it possible, once the wrapping sheet has been closed by folding, to obtain folds which can be very well secured, and also makes it possible for the film to be stored on a roll.

The fact is that the substance used as a sealing coating has little or no adhesion to a smooth surface or to a surface treated for this purpose but, by contrast, exhibits good adhesion when applied to itself, which is what occurs during folding. The folds are therefore secured simply by applying light pressure and by the mutual superposition of certain sealant-coated regions, and this can be achieved without accessories other than those needed for folding the wrapper.

According to the present invention, the term cold sealing is to be understood as meaning sealing which takes place instantly by simple contact at a temperature of between about 0 and 50°C. In point of fact, the temperature is not a critical parameter for obtaining sealing by means of a cold-sealing coating and has practically no influence on the quality of the sealing obtained. Sealing can therefore be achieved without it being necessary to apply additional heat, at the ambient temperature of the place in which the wrapping unit is located.

In fact, cold-sealing coatings have hitherto been used above all in layers on a substrate which experiences little or no deformation. This means that significant problems of blockage due to the self-adhesive properties of the cold-sealing coating throughout the use of this cold-sealing coating on a non-planar substrate could be expected.

The present invention therefore allows the use of films which are less expensive and exhibit better properties (rigidity, printability, aesthetic appearance) for wrapping articles, with no restriction regarding the shape of the said articles.

As to the use of rigid films, it will be noted that hitherto the use of rigid films for packages that have to be sealed by folding has been avoided. This is because these rigid films have a very low ability to hold the fold.

As regards the problem of storing the film on a roll and by comparison with the solutions recommended in the two documents illustrating the state of the art, the present application provides an entirely different solution which was deemed impossible until now and which consists in tolerating the mutual superposition of certain adhesive regions when the film is stored on a roll. For this purpose, the invention envisages choosing a well-determined cold-sealing coating which has what is defined in the application as "controlled adhesion", that is to say adhesion which is strong enough for the requirements involved but not strong enough to oppose repeated unsticking. The film may thus be paid out several times from a storage roll without excess resistance, even in the case of the innermost turns, where the tightness is normally higher. This solution of course offers substantial advantages over the solutions proposed by the aforementioned documents in so far as the same adhesive (and therefore no hot sealant) can be provided everywhere and that the adhesive regions can be provided at the desired points according to the shape of the product that is to be wrapped and the folding sequences.

According to an advantageous embodiment, the structure of the sealant-coated regions comprises, on the right side, two structures of strips arranged in the shape of a W along the two opposite sides of the sheet, one strip along a third side of the sheet and between the two W-shaped structures and two regions in the two corners of the fourth side of the sheet.

The sealing coating strips arranged in the fold configuration may have a width of the order of 4 mm.

The configuration of the structure of the sealing coating strip may have varying forms depending on the article to be wrapped and depending on the folding sequences.

Aside from the strip structure along the folds to be made, each film has a strip of sealing coating along one edge of a third side. This strip will be on the tab which, at the end of the wrapping process, will be the first to be folded down onto the base of the article that is to be wrapped and will adhere to the tab which will be folded down last. Each sheet of wrapping film may also comprise additional regions of sealing coating allowing the tab which is folded down last to adhere to the base of the wrapped article and thus play a part in keeping the wrapper closed.

According to one of the aspects of the present invention, the adhesion achieved by the mutual superposition of the strips of cold-sealing coating is not irreversible, because it must allow the film to be paid out when this film is packaged and stored on a roll, without the risk of the film tearing. Put another way, it is necessary to choose the sealing coating to suit the nature of the substrate to which it is applied so that, on the one hand, it will adhere to itself weakly enough to allow the wrapping film to be paid out from a roll and, on the other hand, strongly enough to allow the package to be sealed almost hermetically. One could here speak of controlled adhesion. This controlled adhesion also has the advantage that the package can be opened and re-closed several times without an appreciable reduction in the quality of adhesion.

As mentioned earlier, one of the benefits of the present invention is that it affords the use of a broad range of possibilities regarding the nature of the substrate used. Examples of appropriate substrates are plastic films about 10 to 100 microns thick made of extruded and oriented polypropylene, of polypropylene in the form of a cast film, of polyester, of polyethylene, of extruded and oriented polyamide or of polyamide in the form of a cast film.

In accordance with the present invention, it is also possible to use a paper substrate (glazed or coated). In general, any backing material or flexible wrapping material may be suitable as a substrate according to the present invention. These various substrates may consist of a single layer, a metallized single layer or several laminated and/or co-extruded layers.

As a general rule, pressure-sensitive adhesives are compositions based on natural and/or synthetic rubber associated with modified cellophanes, phenol-formaldehyde resins or hydrocarbon resins (waxes). In addition to rubbers, it is possible to make widespread use of polymers based on styrene, (meth)acrylic acid or vinyl ether, alone or in combination, and also in combination with resins. Finally, it is also possible to make use of silicone resins. Use will preferably be made of compositions containing mixtures of natural and synthetic rubbers and copolymers of (meth)acrylic acid and styrene.

In accordance with the present invention, the cold-sealing coatings are deposited on the substrates in quantities of 1 to 5 g/m^2 approximately.

The cold-sealing coatings may be applied in the form of a solution, a dispersion or even in the molten state.

BRIEF DESCRIPTION OF THE DRAWINGS

Other particular features and properties of the invention will emerge from the detailed description of a number of embodiments given hereinbelow, by way of illustration, with reference to the appended drawings, in which:

Figure 1 shows the right side of an embodiment of a wrapping sheet;

Figures 2 to 8 illustrate the successive sequences of one example of the wrapping of a sweet using the sheet of Figure 1;

Figure 10 shows the right side of the embodiment of Figure 1 supplemented by an adhesive structure on the reverse side;

Figure 11 shows a cross section, on a larger scale, through one example of an embodiment according to Figure 10, and

Figure 12 depicts a simplified alternative form of the embodiment of Figure 10.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 depicts the right side, or printed side, of a wrapping sheet 20 after the sheet has been cut from a film paid out from a storage roll (not depicted) in the direction depicted by the arrow A in the figure.

The cold-sealing coating is deposited in a structure 22 which is adapted to suit the configuration of the fold lines made during wrapping, and an example of which will be described later on; in the case of Figure 1, there are two structures of strips 24, 26, with a width of the order of ± 4 mm, approximately in the shape of a W, along two opposite sides of the sheet 20, and a strip 28 along a third side of the sheet between the two lateral W-shaped structures. On the opposite side to the side of the strip 28, there are also, in the corner regions, two cold-sealing coated regions 30 and 32. Compared with the initial film stored on the roll, the strips 24, 26 are along the longitudinal edges, while the strip 28 is transversal. On the roll, these various strips of adhesive coating on the right side are on the outside of the various turns of the roll.

The sheet 20 of Figure 1 may be prepared by depositing, on the right side of an oriented polypropylene film 25 microns thick, which may or may not be metallized, a thin printed layer or primer (for example product 10-612205-4 MX41 by the company SIEGWERCK) intended to improve the adhesion of the printing ink. The film is then printed by techniques known per se such as, for example, heliographic or flexographic printing, or

alternatively offset printing. A protective lacquer known per se is deposited over the printing. The structures 22 of cold-sealing coating are then deposited on this lacquer, in the pattern depicted in Figure 1. This deposit may also be performed using printing techniques known per se.

As cold-sealing coating, use may be made of the product IP7905 or IP7936 by the company SWALE which will be deposited, for example, in quantities of 3 g/m^2. This is an adhesive coating which adheres only to itself. In other words, this coating does not adhere to the untreated smooth side of the reverse side of the film, which allows the film to be stored and packaged easily in the form of a roll without there being any problems of unrolling. This sealing coating also has the quality of having a low coefficient of friction (COF) on metal, which is of the order of 0.2 to 0.6, whereas the COF on metal is usually of the order of 1-1.5. This low coefficient of friction reduces the risks of jamming and of adhesion to the folding box.

An operation of wrapping a sweet of roughly parallepipedal shape with the sheet 20 of Figure 1 will now be described with reference to Figures 2 to 8. The sheet is placed over the sweet with the reverse or untreated side facing towards the sweet so that the strip 28 and the opposite side with adhesive regions 30 and 32 are in the longitudinal direction of the sweet and the W-shaped structures are in the transverse direction of the sweet. The sides of the sheet 20 are then folded down over the longitudinal faces of the sweet, as depicted in Figure 2.

The next operation consists in folding the central region of each side of the sheet with the structures 24 and 26 down over the lateral faces of the sweet 34, as depicted in Figure 3. This operation is performed by folding the longitudinal sides of the sheet 20 along oblique fold lines 36 and 38. As may be seen in Figure 3, the two W-shaped structures 24 and 26 (26 is not visible in Figure 3) of the sealing coating are arranged in such a way that the two outer limbs of the W-shaped structures run along the fold lines 36, 38 and that the V-shaped inside part is applied against the transverse side of the sweet 34.

The next operation consists in folding down, on each side of the sweet 34, the two flaps delimited by the fold lines 36 and 38 towards the inside in the direction of arrows 1 and 2 in Figure 3. This operation places the outer strips of the W-shaped sealing-coating structure, that is to say the strips which run along the fold lines 36 and 38, over the inside V-shaped strips and results in the configuration according to Figure 4. These folding

sequences are obviously the same on both lateral sides of the sweet. Given that all of the strips of the two W-shaped structures 24 and 26 are fully superposed and that the cold-sealing coating used adheres perfectly to itself, the configuration of Figure 4 is a stable configuration and perfectly secures the folds made hitherto.

The next folding sequence is depicted in Figure 5 and consists in folding the lower parts of the previously folded and folded down lateral flaps onto the underside of the sweet 34. This operation is performed by folding the longitudinal sides along oblique fold lines 40, 42, 44, 46 which transform the longitudinal sides into trapezium-shaped tabs 48, 50. The result of this folding sequence is clearly visible in Figure 6 which depicts a view from underneath and of the face that was hidden in the previous figures.

Here too, it should be noted that the two cold-sealing coated regions 30 and 32 are arranged in such a way that their inside oblique edges (see also Figure 1) run along the fold lines 40 and 42 of the tab 48, as can be seen in Figure 6.

Figures 7 and 8 illustrate the last phases of wrapping. First of all, tab 50, which has the sealing coating strip 28, is folded down onto the inside face as depicted in Figure 7. The second tab 48 is then folded down onto the tab 50 to form the configuration of Figure 8.

When the tab 48 is folded down, the two sealant-coated regions 30 and 32 are partially superposed on each other and partially applied to the adhesive strip 28 of the tab 50. As a result, given that the tab 48 adheres to itself and to the tab 50, the configuration of Figure 8 is a stable configuration with all the folds held in place securely.

It should, however, be noted that when the tab 48 is folded down onto the tab 50, the adhesive strip 28 adheres to the adhesive regions 30 and 32 only by its ends. They contrast, its central part will come into contact with the reverse side of the tab 48, to which it will not adhere. In other words, while the sheet of Figure 1 produces a wrapping which closes stably and permanently, it does not provide a hermetic seal.

All the wrapping sequences described below are performed automatically in a wrapping machine. In this context, it is important to note that the wrapping sheets proposed are suitable for existing wrapping machines without any need for modification or adaptation. It should, however, be noted that the wrapper described below is merely one example of a folding configuration of a given machine. Other machines may perform folding operations along different fold line configurations. This being the case, the pattern of adhesive

structures shown in Figure 1 would need to be adapted to suit the configuration of the fold lines produced by the folding machine, the reverse being more difficult.

Figure 10 depicts an advantageous embodiment of a wrapping sheet according to the present invention and denoted overall by the reference 56.

Once again, use may be made of an oriented polypropylene film which is printed appropriately, possibly after having deposited a primer. A non-stick coating 60 is then deposited over the entire right side. Suitable non-stick products consist of mixtures of polyamide resin and of polyethylene wax (for example the products 10-609345-3P by the company SIEGWERCK and 994404-X by the company SICPA) deposited in quantities of 1.5 g/m^2. Patterns 22 of cold-sealing coating identical to those of Figure 1 are then applied to this coating. A strip of cold-sealing coating of the dry type is then applied to the reverse side, more or less between the regions 30 and 32 of the right side, as depicted in broken lines at 58. When the sheet 56 is used for the wrapping as described with reference to Figures 2 to 8, the adhesive strip 58, will at the end of the wrapping operation (see Figure 7) be on the inside of the tab 48 and, when this tab is folded over, it will adhere to the adhesive strip 28 of the tab 50 to form a practically hermetic package.

When the film according to Figure 10 is stored in the form of a roll, the adhesive strips 58 on the reverse side are generally in contact with the non-stick coating 60 on the right side, to which they do not adhere. The strips 58 will also nonetheless, as the rolling progresses, and after a certain number of turns, come into contact with the adhesive strips 28. This time, by choosing the nature of the adhesive of the strips 28 and 58 and its controlled adhesion, it will also be possible to unstick and unroll film from a roll, without making the film move and without significantly reducing the adhesive properties of the strips 28 and 58.

Instead of providing strips of sealing coating of a generally rectangular shape, as shown in the figures, it is possible to provide oval bands. This allows progressive detachment, with lower risk of tearing when the wrapper is opened or when the film is paid out from the roll.

Figure 11 is a cross section, on an enlarged scale, through the thickness of one example of a sheet of the embodiment of Figure 10. The various layers, identified by A-F, consist in this advantageous embodiment as follows, A being the right side and F being the reverse side:

A: sealing coating based on latex, deposited in quantities of 2-4 g/m^2, product IP 7985 by the company SWALE,

B: PVB (polyvinylbutynal) lacquer, product WO 48825 by SWALE with additives of wax and with non-stick properties for the coating of the layer F, and deposited in quantities of 0.7-1.3 g/m^2,

C: colour printing with PVB ink, Dynavin series, provided by SWALE and applied in quantities of 2-3 g/m^2,

D: aqueous primer, type 200970 by SWALE, applied in quantities of 0.4-0.8 g/m^2,

E: coextruded oriented polypropylene film of BEZ type, supplied by VIBAC, 30 μ thick and composed of:

E1: metallization layer 0.2-0.04 μ thick,

E2: coextruded layer 1.5 μ thick consisting of a mixture of copolymers and homopolymers

E3: homopolymer core 27 μ thick

E4: homopolymer coextruded layer with non-stick properties for the layer A.

F: cold-sealing coating based on latex and deposited in quantities of 2-4 g/m^2, product IP 7983 by SWALE.

A film produced in this way can be unrolled and rolled up to 10 times on a spool without losing the adhesive properties needed to form a sealed package.

Figure 12 depicts a simplified alternative form of the embodiment of Figure 10. In this alternative form, the sheet 62 comprises simply, on the reverse side, along one of the edges (transverse edge with respect to the film on the roll prior to cutting), a strip 64 of cold-sealing coating corresponding to the strip 58 of Figure 10 and, along the opposite edge, on the right side, another strip 66 of cold-sealant, corresponding to the strip 28 of Figure 10. The construction of the film may be such as described hereinabove with reference to Figure 11. The two strips 64 and 65 have been shown, by way of illustration, and as mentioned earlier, in the shape of an egg, to make detachment when paying out from the roll easier.

In other words, in this alternative form of Figure 10, the structure 24, 26, 30, 32 of sealing coating of Figure 10 is not used. This alternative form may be used when practically hermetic sealing as permitted by the embodiment of Figure 10 is not required and when the closure along the fold lines is not sealed. By contrast, the last phase of the wrapping

consisting of superposing the sealant-coated regions 64 and 66 allows the folds made earlier to be held in place when the wrapping is performed in a machine of the folding box type, that is to say when all the folds mentioned with reference to Figures 3 to 6 are performed practically at the same time.

ABSTRACT

The packaging consists of a film which can be cut into separate sheets intended for wrapping an article and comprising, on the inside with respect to the article that is to be wrapped, particularly a food product, by folding the sheet around this article. To make it easier to select the material for the film without having to take account of its ability to hold a fold, the film comprises, on each sheet, at least one strip of controlled-adhesion cold-sealing coating which secures the folds and closes the wrapper after the phases of folding the sheet around the article that is to be wrapped have been performed.